POTENTIAL IMPACTS OF THE OHIO STATE UNIVERSITY SCARLET AND GREY AG DAY ON ELEMENTARY STUDENT'S PERCEPTIONS OF AGRICULTURE

Honors Thesis

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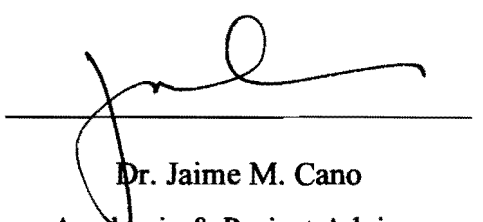

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DEDICATION

This achievement is dedicated to my family and friends who have provided support and understanding throughout this project and college career.

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CHAPTER 1

INTRODUCTION

1.1 Overview of Scarlet and Grey Ag Day Activities

The following discussion can be made regarding the activities students participated in while they attended Scarlet and Grey Ag Day (SGAD). These descriptions will include samples of stations they visited, products they were presented with, locations they visited, and sources of agricultural related items they were presented with.

The first area of agriculture the students were exposed to was animal agriculture. The students learned about animals by interacting with all different types of farm animals. These animals included: beef cattle, dairy cattle, swine, sheep, poultry, horses, llamas, dogs, and even honey bees. Another station that had to do with farm animals was the meat science station that taught students the importance of food safety and meat inspection.

Each presenter that was part of the SGAD had the opportunity to discuss his specialty however he wanted. Two examples of how the students interacted with animals will be discussed, although many interactions were found for each different station the students visited. First is the dairy barn tour at the OSU Waterman Dairy

Laboratory: the students took a walk-through tour of the entire dairy farm operation. This included, but was not limited to visiting the milking parlor, milk tank storage area, calves, heifers, maternity barn, and free-stalls where the current milk cows are kept. During this tour the students got to interact with as many parts of the dairy farming operation as possible including touching cows and petting calves. Any student that was interested could even hand milk a dairy cow that was in the milking parlor.

Another example of animal interaction the students had was with the Ohio Sheep Improvement Association. In this station, students again interacted with sheep but also learned about the characteristics of wool and how it is such a major importance in the students' everyday lives. Most students do not understand that many of the clothes they wear actually come from animals, and this demonstration influenced the students' thinking about how important some animals are to keeping warm with a wool sweater, feeling soft under a wool blanket, and being fire protected with wool clothing.

The next group of stations the students visited included agricultural crops that were harvested for food and other food related products. The students visited stations where they learned about soybeans, corn, wheat, apples, and food science and technology. By identifying and interacting with many of these agricultural crops, the students gained an understanding of how important food and crop agriculture is to their own survival and the survival of the rest of the non-agriculture society.

The Ohio Corn Marketing Program presented one station visited by the students to learn about crops. In this station, the students were given the chance to work in a laboratory setting to investigate the properties of corn. The students became

environmental scientists that developed a biodegradable plastic from the corn. In this station, the students also learned about other beneficial products made from corn such as ethanol and corn syrup.

Another similar station was presented regarding the practical everyday uses of soybeans. At this station the students heard an overview of how soybeans are used not only to feed farm animals, but also how and where soybeans are grown. The presentation also described many of the new uses for soybeans such as making many human foods, crayons, paints, and cooking oils.

The final group of stations the students visited focused on natural resources and international agriculture. This group of stations was designed to help the students gain a better understanding of how agriculture is influenced by nature and how nature is influenced by agriculture. The students visited stations about entomology, aquaculture, horticulture, weed science, and wildlife management. Also, since agriculture is such a global business, the students were also introduced to the concept of international agriculture and shown how much of the world is actually involved in agriculture. These stations were used to describe much of the new, innovative, and smaller parts of agriculture besides the larger portions of corn, soybeans, and animals. After completing these stations, the students had been presented with concepts of wildlife protection, growing needed plants indoors and in green houses, understanding the usefulness of insects in agriculture and how we use and control them, and how fish and other underwater organisms are grown using aquaculture.

The above descriptions are just a few of the total number of stations that the students visited during SGAD. The amount of interaction and learning that students experienced was based on individual students desire to learn the information and the willingness of the student to participate in each station. An overall view of the students' perceptions of agriculture and knowledge of agriculture before and after they attended these stations will be discussed later in this report.

1.2 Problem Identification and Justification

SGAD is a yearly, daylong set of agricultural related stations in which approximately 600 Columbus and surrounding area urban fifth grade students attend at The Ohio State University College of Food, Agricultural, and Environmental Sciences campus and the OSU Waterman Dairy Laboratory. The event is designed to provide the elementary students a hands-on opportunity to interact with many different aspects of agriculture and ultimately increase the students' knowledge and excitement about agriculture. Industry leaders from various agricultural commodities, OSU college faculty and students, and staff from OSU Extension conduct the demonstrations and learning stations that the students attended at SGAD. The fifth graders participate in, and learn about, such topics as the previously mentioned activities.

Blackburn (1999) pointed out that, "Teaching elementary-age children may help them develop a better understanding and perception of agriculture as they grow older" (Online). McReynolds (1985) proposed that, "The earlier in life information about agriculture is presented to children, the more receptive they are to accepting and

applying wholesome concepts about the topic the rest of their lives" (pg. 17). Based on these two proposals related to activities like SGAD, there is great potential for teaching young students about agriculture.

But, the problem with SGAD is that currently, there is no established set of student evaluations to determine if SGAD is actually meeting its goals. With the number of participants increasing yearly, and SGAD's recognition and popularity growing, an evaluation of the student's perceptions about agriculture before and after attendance to SGAD is desperately needed.

The potential impacts that SGAD has on elementary students can be linked to them becoming involved in agriculture in the future, but there is no evidence of this if no evaluation strategy is established. An evaluation process will also help SGAD coordinators with promotional issues related to SGAD to help gain support and a higher attendance rate. Promotion would be much more convincing if there was documented evidence to show that the activities actually impacted the students positively. It is also important to develop a purposeful evaluation of SGAD for credibility to show when applying for grant money to fund the activities. Without funding for SGAD, the event would probably not occur, and evidence of effectiveness is a key to securing funding dollars.

1.3 Purpose and Objectives

Given the preceding discussion about SGAD, the purpose of the study was to assess the potential impacts that SGAD has on urban, fifth grade students from Franklin County. In order to accomplish this purpose, two objectives must be met. The first objective, which was discussed earlier in this chapter, is to describe the activities students participated in when they attended SGAD. This may include descriptions of stations they visited, products they were presented with, locations they visited, and sources of agriculture related items they were presented with. Secondly, the proposed study must describe students' perceptions of agriculture before and after they attended SGAD and must determine the effects of SGAD on the students' agricultural literacy and awareness. These effects should include, but are not limited to: student interest about agriculture, student knowledge of how agriculture impacts his everyday life, student knowledge of agriculture related crops and animals, student knowledge of manufactured products related to agriculture, and student general knowledge about agriculture.

1.4 Limitations

The study was conducted with the intent of determining the potential impacts that Scarlet and Grey Ag Day has on urban, fifth grade students from Franklin County. The researcher selected all students who attended SGAD for the study. The method of surveying the students was conducted using questionnaires mailed to all of the teachers of the students that attended. After the questionnaires were mailed to the teachers, the

researcher could only depend on the teachers to return the questionnaires via the mail. At the start of the study, all of the teachers showed interest in participating in the study, but at the conclusion of the study, two of the teachers failed to return the pre-questionnaires and 8 teachers failed to return the post-questionnaires to the researcher. In describing the outcomes of this study, the missing data from these 10 classes will be dismissed due to the inconsistencies that may be caused because of a pre-and post-questionnaire format of the data analysis.

A second limitation with this study is that the conclusions regarding the output from the SPSS data was generalized to all urban fifth grade students in Franklin County. In actuality, the conclusions only represent students that have attended SGAD although the researcher would expect future studies to result in similar changes in the students.

1.5 Significance of the Problem

Some research has been conducted on agricultural literacy but even less research has been done on agricultural literacy of elementary aged students. This is especially true in the case with Scarlet and Grey Ag Day, which as stated before, currently has no true evaluation tool that shows the impacts of the SGAD activities on the attending student's awareness, literacy, and perception of agriculture. The results of this particular study can be used as a tool in the future to offer support or opposition to previous assumptions of success or failure that SGAD has regarding student's agricultural literacy. This study can also be used to evaluate future SGAD attendee's knowledge of agriculture with more ease than before because this study will provide a

framework for future evaluation tools and questionnaires that may be used in sampling the students' who attend SGAD. This study will also provide a useful, evaluative tool to SGAD coordinators in the future that will help in promotion of activities like SGAD to other learning institutions.

CHAPTER 2

LITERATURE REVIEW

2.1 Research Related to Objectives

The history of our country is deeply rooted in agriculture. The primary aim of farmers during the 1800s was to produce enough food to feed their immediate family. However, slowly the industry of agriculture began to change. During the late 1800s and early 1900s, the industrial, mechanical, and chemical revolutions prompted a rapid decline in the number of people directly involved in production agriculture. That is why today, only three percent of the United States workforce (i.e., 3% of the world's farmers) produces 20% of the world's food supply. What about the other 97% of our population? Should they care about agriculture? Absolutely (Lichte & Birkenholz, 1993)! With few people actually involved in agriculture, agricultural literacy among the non-agriculture public has declined over the years. The question is though: but what can the population involved in agriculture do about the decline in agricultural literacy? Education about agriculture is the answer. The Ag Literacy Coalition (1998) stated that, "Organizations and programs nationwide are working to educate the general population about agriculture's contributions to the food system, the economy, and the interaction between agriculture and the environment. Each program has specific goals

and unique operating styles but they all collaborate and share materials with each other to strengthen their overall impact." (p. 1). Even though these agricultural literacy programs are working together to impact the non-agricultural public, there is still much work to be done to make sure everyone has a better understanding of agriculture and its impacts on society.

As previously mentioned, many programs have been developed and are continuing to be developed to promote agriculture literacy. One such nation wide program is the annual, "National Ag Day," which is celebrated every year on March 20th. Another program, America's Largest Classroom for Agriculture, allows students across the nation to discover how they interact with agriculture every day (American Farm Bureau, 2000). One local agricultural education activity already in progress at The Ohio State University is Scarlet and Gray Ag Day (SGAD). Some other programs, like SGAD currently in place, to promote agricultural awareness, are: the traditional agriculture education programs in high schools, agricultural related newsletters and magazines, coordinated events with agriculture business' and county extension services, various in-service activities for teachers, and other teacher accreditation standards for agriculture just like for other basic subjects (i.e. math and science) (Deeds, 1991).

According to the Committee on Agriculture Education in Secondary Schools, National Research Council (1988), the current outlook on the agricultural literacy problem is that most Americans know very little about agriculture, its social and economic significance in the United States, and particularly, its links to human health and environmental quality. Other than the few activities listed in the previous

paragraph that reach only a select number of people, few systematic educational efforts are made to teach or otherwise develop agricultural literacy in students of any age.

Although, some school-aged children are taught something about agriculture, the materials used by the schools tend to be fragmented, frequently outdated, usually farm oriented, or often negative or condescending in tone. Even though this is the case, most people still agree with the need for a basic understanding of agriculture, the agricultural industry, and its importance to our country and citizens (Frick, Birkenholz, Gardner, & Machtmes, 1995).

The hope is that all students should receive some systematic instruction about agriculture beginning in kindergarten or first grade and continuing through twelfth grade (Committee on Agriculture Education in Secondary Schools, National Research Council, 1988). A quote by Mawby (1984) really points out the importance of an agricultural literate society. Mawby (1984) stated that by "...educating Americans in the wise management of food supplies and related renewable resources, we can anticipate more knowledgeable decision making about agriculture in the future" (p. 72). Mawby's (1984) quote indicates the outlook of agriculture literacy in our nation's history. It is important to remember that the general public, including children, will not become more agriculturally literate unless the small population involved in agriculture comes together to educate and enlighten them about agricultural related topics through outreach activities like SGAD.

CHAPTER 3

METHODOLOGY

3.1 Research Design

This study was descriptive in nature using a two-page questionnaire the students completed both before and after they attended SGAD. The questionnaires were then evaluated and the resultant data analyzed using the entire sample. The results were compiled to identify similarities or differences among the students sampled, before and after they attended SGAD. The researcher to develop conclusions regarding the study's purpose then used the data collected: to assess the potential impacts that Scarlet and Gray Ag Day has on urban, fifth grade students from Franklin County.

3.2 Population and Sample

There were approximately 600 students that were evaluated in this study from 15 different elementary schools located around the Columbus area. The 15 elementary schools included: Avalon, Bluffview, Brentnell Montessori, Burroughs, Clarfield, Colonial Hills, Court, Evening Street, Forest Park, Granby, Indian Springs, Main Street, Scottwood, Valley Forge, and Worthington Hills, and thus became the population of the study. In the 15 different schools, 28 different classes were present at SGAD. Some of

the schools attending had only one class, while others had numerous classes in attendance. The SGAD coordinator provided each school's name, address, principal's name, teachers' names, and number of students attending SGAD. Contact with the teachers was made via the U.S. mail and telephone, if needed.

3.3 Data Collection

Once the schools that were planning on attending SGAD were identified, the data collection began. Packets were mailed containing the student pre-questionnaires (Appendix A), letters explaining the purpose and extent of the study (Appendix B), and directions for the teachers (Appendix C) including: what the questionnaires were, what they were going to be used for, how to distribute them, the date the questionnaires were due to be returned to the researcher, information regarding the follow-up questionnaire, and a return envelope. The pre-questionnaire packets were mailed to 28 teachers on April 12, 2001 and were due back to the researcher by May 1, 2001.

The students completed the pre-questionnaire before they attended SGAD and the teachers returned them to the researcher via the U.S. mail. After the students attended SGAD, a second packet containing the post-questionnaires (Appendix D), letters explaining the conclusion of the study (Appendix E), and a return envelope was then distributed for the same students to complete, and the teachers again returned them via U.S. mail. The post-questionnaire packets were mailed on May 14, 2001 and were due back to the researcher by June 8, 2001.

For the pre-questionnaires, packets were mailed to 28 teachers ($n_1 = 28$) from the different schools and 25 teachers ($n_2 = 25$) returned the packets to the researcher. For the post-questionnaires, packets were again mailed to the same 28 teachers ($n_3 = 28$) and only 20 teachers ($n_4 = 20$) returned the packets to the researcher. Of the packets that were returned to the researcher, only 18 teachers returned both the pre- and the post-questionnaire, and thus these 18 classes became the population of the study, which consisted of 364 students. Regarding the information above, the usable response rate for the pre- and post-questionnaires is approximately 64 percent. Based on this percentage of students, the data output was used to generalize to the other 36 percent of the population that attended SGAD.

3.4 Data Analysis

After the pre- and post-questionnaires were returned to the researcher, data analysis could begin. Analysis of the questionnaires was completed using SPSS 10.1: a computer based analysis program used in reporting frequencies, means, and other common numeric tendencies. Each of the 364 students that completed both the pre- and post-questionnaire was given a random number by the researcher based on the class the student was in to determine the position of that given student in the data entry. The data from the questionnaires was utilized as a numeric type of data using numbers for actual values. One example of this using question number 6 on the questionnaire is,

Place an "X" in the appropriate blank.

Question-Are you interested in agriculture?

Answer- __X__ Yes _____ No.

Using this type of question the researcher was able to use SPSS and set a numeric value of "0" to those students that answered yes, and "1" to those students that answered no to the question. In this example, the researcher would have entered "0" in the corresponding data system, representing a "yes" answer. This type of numeric valuing was used for both questionnaires. By allowing numbers to represent actual answers, the researcher set parameters on each question so that the frequencies of the answers could be analyzed easily. A table of the numeric/value system for all of the questions is included in this report as Appendix F.

After entering the data into the SPSS computer program, the questions were analyzed using frequencies to determine desired outputs that were present in the pre- and post-questionnaires. The analyzed data for questions 1-10 are included in this report as Tables in Chapter 4.

CHAPTER 4

RESULTS

Data gathered from the population of students surveyed was analyzed according to the corresponding question number in the pre- and post-questionnaires. Refer to Appendix A for a sample of the pre-questionnaire and Appendix D for a sample of the post-questionnaire. Also, refer to Appendix F for a chart of the established available answers for the given questions.

4.1 Results for Question #1

Question number one was designed to get a grasp of how many of the students were actually interested in pursuing some type of occupation related to agriculture. When establishing the question, the researcher was hoping that the pre-questionnaire would show a lower percentage of students wanted to be involved in some part of the agricultural industry while the post-questionnaire would show a higher number of students interested. According to the data, the researcher's hypothesis was correct. Even though only a small percentage of the sampled population was interested in becoming involved in agriculture, the increase from the pre- to post-questionnaire more than doubled. Only 0.6 percent of the students wanted to pursue agriculture in the

pre-questionnaire while 1.3 percent were interested in agriculture as a career in the post-questionnaire. Again, even though this is a small number of students, this was the only occupation to increase more 13 percent. Some of the other occupations declined from the pre- to the post-questionnaire. This data is represented in Table 4.1.

1. What do you want to do when you grow up?		
Answer	**Pre-questionnaire (Percent)**	**Post-questionnaire (Percent)**
farmer/agriculture	0.6	1.3
doctor/vet/nurse	22.1	22.6
lawyer	2.8	2.8
teacher	10.4	11.3
pro athlete	18.4	16.0
business person	0.3	0.6
gov't/president/jud	1.5	1.3
rescue worker	1.2	0.6
actor	4.6	5.3
other	38.0	38.1
Total	100.0	100.0
Missing (n)	38.0	46.0
Total (n)	364.0	364.0

Table 4.1: Data output for question 1

4.2 Results for Question #2

Question number two was designed to establish a knowledge of what the students perceived agriculture to be and therefore the researcher placed this question at the beginning of the questionnaire so the students would not have other agricultural related terms to choose from the later questions. The six answers accepted by the researcher were: Farming, Farm animals, Farm crops/produce/food, History, Scarlet and

Grey Ag Day, and Other. From these six answers, the researcher was hoping to see an increase in the first three: farming, farm animals, and farm crops, from the pre- to the post-questionnaire. After analyzing the data, the results were very similar to what the researcher expected. In the pre-questionnaire, 66.5 percent of the students answered one of the first three answers. But in the post-questionnaire, 86.9 percent of the students answered farming, farm animals, or farm crops/produce/food. The data not only showed an increase in overall percentage, but also each answer independently increased from the pre-questionnaire to the post-questionnaire. 49.1 percent answered farming in the pre-questionnaire while 60.6 percent answered farming in the post. 5.3 percent answered farm animals in the pre-questionnaire while 11.3 percent answered farm animals in the post and 12.1 percent answered farm crops in the pre while 15.0 percent answered farm crops in the post. This data is represented in Table 4.2.

2. What is the first word you think of when you hear the word "Agriculture?"		
Answer	**Pre-questionnaire (Percent)**	**Post-questionnaire (Percent)**
farming	49.1	60.6
farm animals	5.3	11.3
farm crops	12.1	15.0
other	30.1	10.3
history	3.1	1.6
SGAD	0.3	0.3
Total	100.0	100.0
Missing (n)	42.0	44.0
Total (n)	364.0	364.0

Table 4.2: Data output for question 2

4.3 Results for Question #3

Question number 3 was designed primarily to gain an understanding of the exposure to agriculture that the population had been exposed to in the past and after attending SGAD. The researcher was expecting the post-questionnaire to be 100 percent because all of the students who completed the questionnaires visited a dairy farm during SGAD. The results of the analyzed data did not come out quite that high, but because of SGAD, more students were exposed to a farm setting than before attending SGAD. For the pre-questionnaire, 83.4 percent of the sampled population had been on a farm before and 96.6 percent answered yes to being on a farm on the post-questionnaire. This 96.6 percent is a much higher number but it is not 100 percent like it should have been because of either student not understanding the question or errors in the data entering. On the other hand, in the pre-questionnaire, 16.6 percent had never been on a farm while only 3.1 percent said they had never been on a farm before in the post-questionnaire. The 3.1 percent is very close to what the researcher expected because of all the students attending SGAD. This data is represented in Table 4.3.

3. Have you ever been on a farm before?		
Answer	Pre-questionnaire (Percent)	Post-questionnaire (Percent)
Yes	83.4	96.6
No	16.6	3.1
Total	100.0	100.0
Missing (n)	33.0	42.0
Total (n)	364.0	364.0

Table 4.3: Data output for question 3

4.4 Results for Question #4

Question number 4 was designed for the researcher to establish a foundation for the amount of in-school exposure to agriculture the students had before attending SGAD. The analyzed data turned out to be what the researcher had expected. According to the pre-questionnaire, 79.0 percent of the students remembered their teachers talking about agriculture in school while 89.8 percent remembered in the post-questionnaire. These numbers correspond to 19.0 percent who did not remember their teachers talking about agriculture in school in the pre-questionnaire while only 9.6 percent could not remember in the post-questionnaire. The 79.0 percent on the pre-questionnaires may even be a little bit high because when the teachers talked about taking a field trip to SGAD, the students may have considered that as, "talking about agriculture," when in fact the question was supposed to be more centered on actual lessons in agriculture or other curriculum related references to agriculture by their

teachers. Even though this may be true, the numbers still increased after SGAD. This data is represented in Table 4.4.

4. Have any of your teachers ever talked about agriculture in school before?		
Answer	Pre-questionnaire (Percent)	Post-questionnaire (Percent)
Yes	79.0	89.8
No	21.0	9.6
Total	100.0	100.0
Missing (n)	36.0	42.0
Total (n)	364.0	364.0

Table 4.4: Data output for question 4

4.5 Results for Question #5

Question number 5 was designed to specifically understand if the students could relate agriculture to their everyday lives and how it affects them daily. One of SGAD's intentions is to allow the students to better understand how agriculture does affect them daily. The question was analyzed according to how many, out of three answers, the students correctly answered.

The outcome of the data for this question was rather astounding in that on the pre-questionnaire, 25.4 percent answered zero correct, 19.9 percent answered one correct, 22.1 percent answered two correct, and 32.6 answered all three correct. These numbers for the post-questionnaire are 6.5, 9.6, 28.0, and 55.9 percent, respectively.

The data in this observation is amazing because of the number of students that increased from knowing only one or two answers, to 55.9 percent of the students knowing three answers. This data is represented in Table 4.5.

5. List three ways agriculture affects your life.		
Answer	**Pre-questionnaire (Percent)**	**Post-questionnaire (Percent)**
None listed	25.4	6.5
One listed	19.9	9.6
Two listed	22.1	28.0
Three listed	32.6	55.9
Total	100.0	100.0
Missing (n)	33.0	42.0
Total (n)	364.0	364.0

Table 4.5: Data output for question 5

4.6 Results for Question #6

Question number 6 was designed to gain some insight as to whether or not SGAD actually influences the students' interest in agriculture. The data revealed in this question was not as dramatic as in the last five questions. In the pre-questionnaire, 47.2 percent of the students were interested in agriculture while 52.1 percent were not. In the post-questionnaire, the numbers were almost flipped with 51.6 percent interested in agriculture and 47.8 not interested in agriculture. Even though these numbers are very close, during the data entry process, many of the reasons given for not being interested

in agriculture were very shallow such as: not enough time to be interested in agriculture, I don't want to be a farmer, and I don't know enough about it. These examples are very good at showing how activities like SGAD are good at informing students more about agriculture and how they can become involved or are already involved in agriculture. This data is represented in Table 4.6.

6. Are you interested in agriculture?		
Answer	Pre-questionnaire (Percent)	Post-questionnaire (Percent)
Yes	47.2	51.6
No	52.1	47.8
Total	100.0	100.0
Missing (n)	38.0	42.0
Total (n)	364.0	364.0

Table 4.6: Data output for question 6

4.7 Results for Question #7

Question number seven is designed to check for general agricultural knowledge that the students have about agricultural animals. Again, this question was analyzed according to how many, out of three answers, the students correctly answered. The researcher thought many of the students would gain knowledge regarding this question by attending SGAD. The data for this question is again very astounding regarding how much knowledge the students gained after attending SGAD than before they attended.

From the pre-questionnaire, 16.0 percent answered zero correct, 3.6 percent answered one correct, 5.1 answered two correct, and 75.3 answered three correct. These numbers significantly increased for the post-questionnaire to 0.9, 0.0, 5.0, and 94.1 percent, respectively. The data from the pre- to the post-questionnaire increased drastically regarding the number of students that knew three types of animals raised for agricultural use. This increase is most likely due to the exposure and interaction to animals that the students received at SGAD. This data is represented in Table 4.7.

7. List three types of animals raised for agricultural use?		
Answer	**Pre-questionnaire (Percent)**	**Post-questionnaire (Percent)**
None listed	16.0	0.9
One listed	3.6	0.0
Two listed	5.1	5.0
Three listed	75.3	94.1
Total	100.0	100.0
Missing (n)	32.0	43.0
Total (n)	364.0	364.0

Table 4.7: Data output for question 7

4.8 Results for Question #8

Question number eight is designed similar to question number seven, to gain insight into the general agricultural knowledge that the students have about agricultural crops. This question was analyzed according to how many, out of two answers, the

students got correct. The data from the pre-questionnaire showed 16.3 percent answered zero correct, 7.2 answered one correct, and 76.5 percent answered two correct. These numbers from the post-questionnaire are 4.8, 2.9, and 92.3 percent, respectively. The numbers between the pre- and post-questionnaires are not as drastically different in this question than they were in question number seven, although an almost 15 percent increase in getting both answers correct is a rather high percentage change. This data is represented in Table 4.8.

8. What are two types of agricultural field crops?		
Answer	**Pre-questionnaire (Percent)**	**Post-questionnaire (Percent)**
None listed	16.3	4.8
One listed	7.2	2.9
Two listed	76.5	92.3
Total	100.0	100.0
Missing (n)	32.0	52.0
Total (n)	364.0	364.0

Table 4.8: Data output for question 8

4.9 Results for Question #9

Question number nine was designed to see whether, as fifth graders, the students knew or could understand that a very small percentage of the world population produces a majority of the food and fiber for the remaining population. This question was

analyzed for either a correct or an incorrect answer. After analyzing the pre-questionnaire data, only 9.3 percent of the students answered correctly while 90.1 percent answered incorrectly. This is in contrast to the post-questionnaire where 25.7 percent of the students answered correctly and 73.6 percent answered incorrectly. This drastic increase in correct answers from 9.3 to 25.7 percent could only be the result of the students learning about agriculture at SGAD because the increase of almost 14 percent is not likely going to be due to chance throughout the analyzed population. This data is represented in Table 4.9.

9. What percent of the U.S. population are farmers?		
Answer	**Pre-questionnaire (Percent)**	**Post-questionnaire (Percent)**
Correct	9.3	25.7
Incorrect	90.1	73.6
Total	100.0	100.0
Missing (n)	32.0	53.0
Total (n)	364.0	364.0

Table 4.9: Data output for question 9

4.10 Results for Question #10

Question number ten was designed to analyze the students' overall knowledge of agricultural animals. The question was matching in nature where six animals were listed on the left column and seven answers were listed on the right column. This question was analyzed according to how many, out of six possible matches, the students

got correct. Analyzing this question did not turn out as the researcher had hoped. According to the analyzed data in the pre-questionnaire, 1.8 percent matched zero correct, 0.6 percent matched one correct, 0.3 percent matched two correct, 6.0 percent matched three correct, 21.9 percent matched four correct, 24.6 percent matched five correct, and 44.7 percent matched six correct. The data analyzed in the post-questionnaire did not show any conclusive changes in the percentages from the pre-questionnaire. The post percentages were 0.3, 0.6, 1.3, 3.9, 15.4, 30.5, and 47.6 percent respectively. When the percentages of answering five or six correct were combined, there was a slight increase from 69.3 percent in the pre-questionnaire to 78.1 percent in the post-questionnaire. Other than this slight increase, not much other evidence of improvement was noticed according to the outcome of this question. This data is represented in Table 4.10.

10. Match the following products with the correct letter in the right hand column.		
Answer	**Pre-questionnaire (Percent)**	**Post-questionnaire (Percent)**
None correct	1.8	0.3
One correct	0.6	0.6
Two correct	0.3	1.3
Three correct	6.0	3.9
Four correct	21.9	15.4
Five correct	24.6	30.5
Six correct	44.7	47.6
Total	100.0	100.0
Missing (n)	31.0	53.0
Total (n)	364	364

Table 4.10: Data output for question 10

4.11: Population Information

The following information was not used in the data analysis process but the researcher included it based on the need to understand what population of students attended SGAD. Included in this section are tables showing the gender of the students (Table 11), the age of the students (Table 12), and the race and/ or ethnic background of the students (Table 13).

11. What is your sex?	
Answer	**Pre-questionnaire (Percent)**
Male	50.0
Female	49.1
Total	100.0
Missing (n)	32.0
Total (n)	364.0

Table 11: Sex of students

12. How old are you?	
Answer	Pre-questionnaire (Percent)
9	7.9
10	38.7
11	50.0
12	2.4
Total	100.0
Missing (n)	36.0
Total (n)	364.0

Table 12: Age of students

13. What is your Race or Ethnic Background	
Answer	Pre-questionnaire (Percent)
American Indian/ Alaskan Native	1.6
Asian or Pacific Islander	4.1
Black	17.1
Hispanic	0.6
White	62.7
Other	13.6
Total	100
Missing (n)	48
Total (n)	364

Table 4.13: Race/Ethnic Background

CHAPTER 5

DISCUSSION

5.1 Conclusions

Given that the overriding purpose of this study was to assess the potential impacts that SGAD has on urban, fifth grade students from Franklin County, the following conclusions regarding the objectives of this study can be made. The following discussion will describe the students' perceptions of agriculture before and after they attended SGAD.

Question #1

Based on question one results, more students wanted to be involved in some sort of agricultural related profession when they grew up after they attended SGAD than before they attended SGAD. Though the total number of students increased little, the percentage of students increased much more than any other occupation on the survey. The data concludes that after the students attended SGAD, more students were aware of and interested in occupations involving agriculture. This is an obvious key to educating the public about agriculture. Many job opportunities currently exist and will continue to exist in agriculture, but without proper education of the general public with activities

similar to SGAD, the awareness and desire to pursue careers in agriculture will continue to be low.

Question #2

Question number two results show an increase in knowledge base about agriculture from the data of the pre-questionnaire to the post-questionnaire. Based on the increasing percentage of students that identified farming, farm animals, or farm crops as their answers shows the definite ability of the students to recognize and understand some basic concepts involved in agriculture. This is key in establishing knowledge of agriculture in the non-agriculture public although the knowledge needs to be more in depth than just farming, farm animals and farm crops. For fifth graders, this basic knowledge of farming, farm animals and farm crops is a good beginning.

Question #3

The results of question number three show that before the students attended SGAD, approximately 15 percent of the students had never been on a farm before. According to the post-questionnaires, only about 3 percent of the students had never been on a farm. This is a good indication of how important it is to get the students involved in activities like SGAD. If not for SGAD, it can be assumed that most of the 15 percent would never have traveled to a farm and experienced the activities they did during their visit.

Question #4

Question number four results relay the concept of teacher interaction that results from attending SGAD. The data shows that because of attendance to SGAD, the percentage of students that remember their teachers discussing agriculture in school increased from 79 percent to almost 90 percent. This is a great achievement for SGAD because one of the obstacles related to agricultural illiteracy is getting the schools to buy into the fact that agriculture is important. SGAD has an impact on the students', as well as the teachers', perceptions of agriculture.

Question #5

Question number five results describe the overall impact that SGAD had on the students. The question was designed to establish a basis for how the students' felt agriculture affects them daily. The data shows that before attending SGAD, many students did not know of three ways agriculture affected them, but on the contrary, after attending SGAD, over 50 percent of the students could list three ways that agriculture affects their lives. The data for this question is the most important data to come out of the questionnaires because it shows how important SGAD is at showing students how agriculture affects them individually.

Question #6

Question number six is another question that is a good indicator for how well SGAD influenced the students' that attended. The students' interest in agriculture now,

will greatly influence their knowledge and information base of agriculture as an adult. Based on the data gathered by the pre- and post-questionnaires, the amount of influence on students' interest in agriculture was fairly low. The pre-questionnaire showed approximately 47 percent of the students were interested in agriculture and after attending SGAD approximately 52 percent of them were interested. This is not a big change in percentage, but considering that SGAD is only one day, it would be harder to change the interests of every student, rather than just giving the students an introduction to many aspects of agriculture and allowing them to learn more about it on their own time or in school.

Question #7

Question number seven did a great job analyzing the students' knowledge about agricultural related animals. The knowledge base of the students before they attended SGAD was really high shown by 78 percent of the students identifying three types of animals raised for agricultural use. On the other hand, after the students' attended SGAD, 94 percent of the students correctly identified three types of animals. Also, in the pre-questionnaire, approximately 16 percent of the students could not identify one animal while in the post-questionnaire, only less than 1 percent could not identify an animal. This concludes that even though SGAD did not give every student the knowledge to identify three animals, it did give every student a better knowledge base about agricultural related animals, which is one of the intended purposes of SGAD.

Question #8

Question number eight did a good job at identifying the student's level of knowledge regarding agricultural crops. Based on the data, after the students attended SGAD, more of them had a better understanding of the different types of agricultural crops. Based on what the students observed at SGAD regarding agricultural crops, the data corresponds with what should have been noticed from the pre- and post-questionnaires. Approximately 76 percent of the students could identify two agricultural crops before attending SGAD and approximately 92 percent could after attending SGAD. By attending SGAD, not only did the students have a better knowledge of agricultural related crops and animals, but also for many, this was the first time they had actually seen corn or soybeans up close and touched them. The same is true for animals, such as the dairy cows and calves. By allowing the students hands-on interaction with agriculture, it increased their desire to learn about it now and in the future.

Question #9

Question number nine had a great impact on viewing the students' knowledge about agriculture and their perceptions on how many people are farmers. Based on the data, before attending SGAD, not many students were familiar with the number of people that farm; but after attending SGAD, the number of students that understood only a very small percentage of the population is a farmer increased dramatically. Before attending SGAD, only 9 percent of the students answered this question

correctly; but after attending SGAD, 26 percent of them answered it correctly. This analysis shows that the students that attended SGAD have a much better understanding of the number of people involved in agriculture than before attending.

Question #10

Question number ten results did not correspond correctly to what the researcher had hoped. Based on this question, the students did not gain any knowledge from SGAD because the percentages of the pre-questionnaire and the post-questionnaire are very similar. This indicates that either the students did not learn any new information regarding the question at SGAD , which is highly unlikely, or the question was confusing to the students, therefore not affecting the results and showing no differences in knowledge from before and after attending SGAD. The researcher also hypothesized that because the students did not receive enough information regarding products of animals, they did not gain the knowledge that the researcher expected.

5.2 Recommendations

Interested parties, including Scarlet and Grey Ag Day coordinators and evaluators, agricultural literacy advocates, and others involved in similar activities, should review the findings of this study and use the information to maintain, improve, revise, and build on the previous experiences related to activities similar to SGAD. SGAD coordinators should use this study as a tool to examine the effectiveness of past and future SGAD activities. They should also use the data relative to their individual

needs in assessing parts of SGAD that need to be replaced and/or revised to maximize the beneficial nature of these types of activities. SGAD coordinators and evaluators should use the questionnaires of this study as a guide to future evaluation tools similar to this one.

Coordinators of SGAD and similar functions need to recognize that only about one-half of the students that attend SGAD are interested in agriculture both before and after they attend SGAD. By recognizing the implications and benefits that SGAD has on the students attending, improvements can be made to meet the needs and wishes of all those who attend.

It is also important to recognize that after students attended SGAD, their knowledge base about agriculture was much higher than before attending. It is important to maintain the same high level of information at future SGAD but also important to allow the students to benefit from SGAD in other ways they are currently lacking in.

Another point of emphasis that the researcher believes needs to be addressed regarding SGAD is the coordination of SGAD activities with other agricultural literacy programs already in place. In order to improve the educational component of SGAD, the activities should be used in conjunction with current programs such as the FFA Food for America and the Farm Bureau Ag in the Classroom, along with the previously mentioned National Ag Day. If efforts could be made to allow students to be introduced to agriculture through these types of agricultural programs before attending

SGAD, they could have a better base knowledge regarding agriculture and then SGAD could increase that knowledge and interest level even more.

Another recommendation for the coordinators of SGAD activities is to use SGAD as a stepping-stone for future student interaction with agriculture. After the students attend SGAD, there should be a follow-up curriculum that could be developed for teachers to use in the classrooms to continue the agricultural education beyond SGAD. By implementing these actions, the impacts of SGAD could extend beyond a single day of agriculture to a weeklong, month long, or even a yearlong implementation of agriculture into the students' classrooms.

In conclusion, although most of the students benefited from attending SGAD, it is recommended that steps be taken to assure a more proactive approach to evaluating future Scarlet and Grey Ag Days. By doing so, this will assure the highest level of achievement and agricultural literacy for all future students who attend SGAD.

5.3 Future Investigations

Overall, this study reinforces the notion that activities like SGAD positively influence student's knowledge, perceptions, and awareness of agriculture. However, further research needs to be done in order to gain a better interpretation of the effects of SGAD on students over an extended period of years. Studies similar to this one should be conducted each year the SGAD is held and the results should be combined to establish a prolonged set of data for evaluating long-term effects of agricultural related

activities on students. For future research, a few questions emerged as a result of this study that may provide a basis for further investigation.

1. What are the individual schools and/or classroom (not grouped) results of this study?
2. What are the results of the pre-questionnaire versus the post-questionnaire of each individual student?
3. How does location of schools (urban, rural, or suburban) affect the outcome of the results, for both the pre- and post-questionnaire?
4. How much information from activities like SGAD do the students retain 2, 5, or even 10 years in the future?
5. What activities at SGAD did the students enjoy the most?
6. What activities at SGAD did the students benefit the most and/or learn the most from and why?
7. Does social status play an important role in the agricultural literacy of the students?
8. Do parents' and/or grandparents' occupations have an effect of student's knowledge base about agriculture?
9. Do teachers discuss agricultural related topics more in school after attending SGAD than before attending?

10. How are student's perceptions of agriculture different based on the gender of the student?
11. How are the student's perceptions of agriculture different based on the race and/or ethnic background of the student?

These questions should be used as a basis for further research or evaluation about the agricultural literacy of elementary students.

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APPENDICES

APPENDIX A

Student Survey

This is a survey for you to complete before you attend the Scarlet and Gray Ag. Day at Ohio State. This survey is designed to evaluate how much you have been exposed to and know about agriculture. Please complete the following questions to the best of your ability.

Name: _____

Directions:
Place an "X" or fill in the blanks where appropriate.

1. What do you want to do when you grow up?
   _____

2. What is the first thing you think of when you hear the word "**Agriculture**?"
   _____

3. Have you ever been on a farm?
   ____Yes ____No

4. Have any of your teachers ever talked about agriculture in school?
   ____Yes ____No

   If you have talked about agriculture in school, what did you talk about?
   _____
   _____

5. List three ways that agriculture affects your life.
   1. _____
   2. _____
   3. _____

6. Are you interested in agriculture?
   ____ Yes ____ No

   Tell why you **are** interested or **are not** interested in agriculture.
   _____
   _____

7. List three types of animals raised for agricultural use?
   1. _____
   2. _____
   3. _____

8. What are two types of agricultural field crops?
   1. _____

2. _____

9. What percent of the United States population are farmers? **(Circle only one answer)**
   a. 2%
   b. 15%
   c. 50%
   d. 75%

10. Match the following products with the correct letter in the right hand column.

____ cattle	a. bacon and sausage
____ sheep	b. honey
____ chickens	c. rubber ball
____ swine	d. recreation and transportation
____ horse	e. eggs
____ bees	f. milk and yogurt
	g. wool

11. What is your sex?
    ____ Male ____ Female

12. How old are you?
    ____

13. What is your Race or Ethnic Background? **(Optional)**
    ____ American Indian/ Alaskan Native
    ____ Asian or Pacific Islander
    ____ Black
    ____ Hispanic
    ____ White
    ____ Other

14. What does your father do for a living?

    _____

15. What does your mother do for a living?

    _____

APPENDIX B

Brandon Fox
10492 St. Rt. 188
Pleasantville, OH 43148
(740) 468-3529
Email: fox.233@osu.edu

Dear Educator:

I am a senior honor's student at OSU majoring in Agricultural Education. Currently I am working with an OSU faculty member to complete a senior honors thesis.

With the cooperation of teachers, students, and all others involved, I hope to gain a better understanding of how the Ag Day activities actually influence students' perception of agriculture. I am conducting this study in two segments, one before the students attend Ag Day and then another following Ag Day. Since your students are going to attend Ag Day, please have your students complete the enclosed surveys before they attend Ag Day and then your students will complete a similar survey about agriculture after they attend Ag Day.

Enclosed are the first surveys that I would like for you to distribute to the students in your class. Please return them to me at the above address by **May 1, 2001**. The second survey will be mailed after the students attend Ag Day for them to complete. Please feel free to email any questions you may have regarding the evaluations to **(fox.233@osu.edu)** or call me at the above phone number.

I sincerely want to thank you for your cooperation and assistance in this evaluation process. I look forward to receiving the evaluations.

Sincerely,

Brandon Fox

Directions for the Teacher

Please distribute the Ag. Day survey to every student that will be attending this year's Scarlet and Gray Ag. Day at The Ohio State University. It is important to let the students know that they are not being graded on this survey but rather it is going to be used by staff at OSU to evaluate the activities that Ag. Day present. Also, these surveys will be used to better promote learning activities like Ag. Day to other colleges and universities by showing recorded evaluation results.

It is also important on your part as the teacher, to make sure you do not tell the students the answers on the survey. I want the survey to be based on only previous knowledge about agriculture that the students have received.

As stated in the cover letter, the student surveys are to be returned in the envelope provided to the address below before March 30, 2001.

Brandon Fox
10492 St. Rt. 188
Pleasantville, OH 43148

Once again, thank you for your cooperation and I look forward to seeing you and the students at the Scarlet and Gray Ag. Day.

APPENDIX D

Student Survey

This is a survey for you to complete after you attended the Scarlet and Gray Ag Day at Ohio State. This survey is designed to evaluate how much you have been exposed to and know about agriculture through Ag Day. Please complete the following questions to the best of your ability.

Name: _____

Directions:
Place an "X" or fill in the blanks where appropriate.

1. What do you want to do when you grow up?
   _____

2. What is the first thing you think of when you hear the word "**Agriculture**?"
   _____

3. Have you ever been on a farm?
   ____Yes ____No

4. Have any of your teachers ever talked about agriculture in school?
   ____Yes ____No

   If you have talked about agriculture in school, what did you talk about?
   _____
   _____

5. List three ways that agriculture affects your life.
   1._____
   2._____
   3._____

6. Are you interested in agriculture?
   ____ Yes ____ No

   Tell why you **are** interested or **are not** interested in agriculture.
   _____
   _____

7. List three types of animals raised for agricultural use?
   1._____
   2._____
   3._____

8. What are two types of agricultural field crops?
   1. _____
   2. _____

9. What percent of the United States population are farmers? **(Circle only one answer)**
   a. 2%
   b. 15%
   c. 50%
   d. 75%

10. Match the following products with the correct letter in the right hand column.

____ cattle	a. bacon and sausage
____ sheep	b. honey
____ chickens	c. rubber ball
____ swine	d. recreation and transportation
____ horse	e. eggs
____ bees	f. milk and yogurt
	g. wool

APPENDIX E

Brandon Fox
10492 St. Rt. 188
Pleasantville, OH 43148
(740) 468-3529
Email: fox.233@osu.edu

Dear Educator:

I hope you enjoyed Scarlet and Gray Ag Day at OSU! With the cooperation of teachers, students, and all others involved, I hope to gain a better understanding of how the Ag Day activities actually influence students' perception of agriculture. Your students completed a survey about agriculture about one month ago, before they attended Ag Day. It is now time for them to complete the second survey, now that they have attended Ag Day.

Enclosed are the final surveys that I would like for you to distribute to the students in your class. Please return them to me at the above address by **June 8, 2001**. This will be the final survey your students will need to complete. Please feel free to email any questions you may have regarding the evaluations to (**fox.233@osu.edu**) or call me at the above phone number.

I sincerely want to thank you for your cooperation and assistance in this evaluation process. I look forward to receiving the evaluations.

Sincerely,

Brandon Fox

Appendix F

SPSS Numeric Code for Data Entry		
Question No.	**Code Number**	**Value**
1	1	farmer/agriculture
	2	doctor / vet / nurse
	3	lawyer
	4	teacher
	5	pro athlete
	6	business person
	7	gov't / president / judge
	8	rescue worker
	9	actor
	10	other
2	1	farming
	2	farm animals
	3	farm crops / produce / foods
	4	other
	5	history
	6	SGAD
3	0	yes
	1	no
4	0	yes
	1	no
5	0	zero correct
	1	one correct
	2	two correct
	3	three correct
6	0	yes
	1	no
7	0	zero correct
	1	one correct
	2	two correct
	3	three correct
8	0	zero correct
	1	one correct
	2	two correct
9	0	incorrect answer
	1	correct answer
10	0	zero correct
	1	one correct
	2	two correct
	3	three correct
	4	four correct
	5	five correct
	6	six correct